

IN THE CLAIMS

Please amend claims 1, 11, and 21 and add new claims 27-29 as follows:

1. (CURRENTLY AMENDED) An apparatus for rendering animated image data in real time, comprising:
 - texture storage means;
 - data storage means configured to store data, including scene data, that defines a plurality of sequentially displayable scenes, each of which is rendered as an image sequence in real time, wherein data for each of said scenes includes a texture for the respective scene, that requires transfer to said texture storage means in advance of said scene being rendered; and
 - central processing means and graphical processing means configured to perform operations to render said scenes, without a pause between scenes, said operations being under control of said central processing means, which is configurable to execute instructions for performing the steps of:
 - (a) rendering the next frame of the current scene;
 - (b) estimating a bandwidth availability for texture transfer that is unlikely to interfere with the real-time rendering of the current scene;
 - (c) identifying the amount of data in a texture required for rendering a next scene;
 - (d) splitting said required texture into texture portions that satisfy said bandwidth availability; and
 - (e) transferring one of said texture portions from said data storage means to said texture storage means using said available bandwidth while rendering, in real-time, the current scene.
2. (ORIGINAL) Apparatus according to claim 1, wherein said estimating step (b) includes steps of:
 - (b1) measuring a processing availability with reference to a due time for a frame in a regularly updated frame sequence;
 - (b2) updating an adaptive statistical model with said processing availability; and

(b3) obtaining an availability estimate from said updated adaptive statistical model.

3. (ORIGINAL) Apparatus according to claim 1, wherein said splitting step (d) includes splitting said texture along texture pixels.

4. (ORIGINAL) Apparatus according to claim 1, wherein said transferring step (e) is performed by a process of direct memory access.

5. (ORIGINAL) Apparatus according to claim 1, wherein said texture storage means includes texture memory management means for deleting textures.

6. (ORIGINAL) Apparatus according to claim 1, wherein said central processing means is configured to execute instructions for performing the additional steps of:

(f) selecting a texture for deletion from said texture storage means; and

(g) deciding whether to delete said selected texture in response to the time before the next frame is due to be rendered.

7. (ORIGINAL) Apparatus according to claim 1, including image combining means for combining rendered animation images with images from a live video camera.

8. (ORIGINAL) Apparatus according to claim 1, wherein said central processing means is configured to modify a scene animation projection in response to camera position data.

9. (WITHDRAWN) An apparatus for rendering animated image data in real time, comprising:

texture storage means;

data storage means configured to store data including scene data, that defines a plurality of sequentially displayable scenes, each of which will be rendered as an image sequence in real time, wherein data for each of said scenes includes a texture for the respective scene and said texture is transferable to said texture storage means in advance of its rendering; and

central processing means and graphical processing means configured to perform operations to render said scenes, without a pause between scenes, and it is necessary to remove textures from said texture storage means in order facilitate texture storage for next scenes; wherein said operations are under the control of said central processing means that is configured to execute instructions for performing the steps of:

- (a) rendering the next frame of the current scene;
- (b) identifying a time before the rendering for the next frame begins;
- (c) comparing said time identified at step (b) with the time required to delete a texture from said texture storage means; and
- (d) deleting a texture from said texture storage means if deletion of the texture can be completed before the next frame rendering is due to begin.

10. (WITHDRAWN) Apparatus according to claim 9, wherein said central processing means is configured to execute instructions for performing the additional step of:

- (e) downloading a texture into a portion of said texture storage means that has been emptied by said deleting step (d).

11. (CURRENTLY AMENDED) A method of rendering animated image data in real time without a pause between scenes comprising:

- (a) rendering a next frame of a current scene, wherein each scene includes a texture that is transferred to a texture storage means in advance of rendering its respective scene;

(b) estimating a bandwidth availability for texture transfer that is unlikely to interfere with real-time rendering of the current scene;

(c) identifying the amount of data in a texture required for rendering a next scene;

(d) splitting said required texture into texture portions that satisfy said bandwidth availability; and

(e) transferring one of said texture portions from a data storage means to the texture storage means using said available bandwidth while rendering, in real-time, the current scene, wherein the data storage means includes scene data defining a plurality of sequentially displayable scenes.

12. (ORIGINAL) A method according to claim 11, wherein said estimating step (b) includes the steps of:

(b1) measuring a processing availability with reference to a due time for a frame in a regularly updated frame sequence;

(b2) updating an adaptive statistical model with said processing availability; and

(b3) obtaining an availability estimate from said updated adaptive statistical model.

13. (ORIGINAL) A method according to claim 11, wherein said splitting step (d) includes splitting said texture along texture pixels.

14. (ORIGINAL) A method according to claim 11, wherein said transferring step (e) is performed by a process of direct memory access.

15. (ORIGINAL) A method according to claim 11, including deleting textures from said texture storage means.

16. (ORIGINAL) A method according to claim 11, further comprising:

- (f) selecting a texture for deletion from said texture storage means; and
- (g) deciding whether to delete said selected texture in response to an assessment of the time available before the next frame is due to be rendered.

17. (ORIGINAL) A method according to claim 11, further comprising combining rendered animation images with images from a live video source.

18. (ORIGINAL) A method according to claim 11, further comprising modifying a scene animation projection in response to camera position data.

19. (WITHDRAWN) A method of rendering animated image data in real time comprising:

- (a) rendering a next frame of a current scene, wherein each scene includes a texture that is transferable to a texture storage means in advance of the scene's rendering, and wherein scene data defines a plurality of sequentially displayable scenes, each of which will be rendered as an image sequence in real time without a pause between scenes;

- (b) identifying a first time before the rendering for the next frame begins;

- (c) comparing said first with a second time required to delete a texture from said texture storage means; and

- (d) if it can be completed before the next frame rendering is due to begin, deleting a texture from said texture storage means.

20. (WITHDRAWN) A method according to claim 19, further comprising:

- (e) downloading a texture into a portion of said texture storage means that has been emptied by said deleting step (d).

21. (CURRENTLY AMENDED) An article of manufacture comprising a program storage medium readable by a computer and embodying one or more instructions executable by the computer to perform a method for rendering image data, the method comprising:

(a) storing data including scene data that defines a plurality of sequentially displayable scenes to be rendered as an image sequence in real time, wherein data for each said scene includes a texture for the respective scene that is transferred to storage in advance of its rendering;

(b) rendering a next frame of a current scene;

(c) estimating a bandwidth availability for texture transfer that is unlikely to interfere with the real time rendering of the current scene;

(d) identifying an amount of data in a texture required for rendering the next scene;

(e) splitting said required texture into one or more texture portions that satisfy said bandwidth availability; and

(f) transferring one of said texture portions to storage using said available bandwidth while rendering, in real-time, the current scene.

22. (ORIGINAL) An article of manufacture according to claim 21, wherein the estimating further comprises:

measuring a processing availability with reference to a due time for a frame in a regularly updated frame sequence;

updating an adaptive statistical model with said processing availability; and

obtaining an availability estimate from said updated adaptive statistical model.

23. (ORIGINAL) An article of manufacture according to claim 21 wherein the splitting further comprises splitting said texture along texture pixel.

24. (ORIGINAL) An article of manufacture according to claim 21, wherein the method further comprises:

- (f) selecting a texture for deletion from said texture storage means; and
- (g) deciding whether to delete said selected texture in response to the time before the next frame is due to be rendered.

25. (ORIGINAL) An article of manufacture according to claim 21, wherein the method further comprises combining rendered animation images with images from a video source.

26. (ORIGINAL) An article of manufacture according to claim 21, wherein the method further comprises modifying a scene animation projection in response to camera position data.

27. (NEW) The apparatus of claim 1 wherein the available bandwidth occurs between the rendering of the next frame in the current scene and a buffer swap for rendering a subsequent frame in the current scene.

28. (NEW) The method of claim 11 wherein the available bandwidth occurs between the rendering of the next frame in the current scene and a buffer swap for rendering a subsequent frame in the current scene.

29. (NEW) The article of manufacture of claim 21 wherein the available bandwidth occurs between the rendering of the next frame in the current scene and a buffer swap for rendering a subsequent frame in the current scene.